FACT SHEET

ADER: Estimating Displaced Power Grid Emissions from EE/RE

Overview of Average Displaced Emissions Rate (ADER)

Recognizing the analytical challenges in estimating displaced emissions from energy efficiency measures and clean energy technologies, US EPA has developed a new approach to estimating displaced emissions from the power grid — the "Average Displaced Emissions Rate" (ADER) methodology. ADER accounts for the integrated response of power markets to changes in electricity demand/supply. The methodology consists of two parts: (1) estimation of ADER parameters and (2) application of these parameters to energy efficiency or clean energy technology load impact estimates. ADER parameters are estimated for SO_2, NO_x, CO_2 and Hg using ICF's Integrated Planning Model (IPM®) and describe the change in emissions for a unit change in electricity demand/supply. The parameters vary by year, geographic region, season, and hour block. To produce estimates of displaced emissions, these ADER parameters can be applied to generation displaced from any efficiency measure or clean technology taking into account the region, year, season, and load shape of the application.

Key Features of ADER Approach

- Estimates are specific to:

  -- Hour Blocks (11 total) or combinations thereof representing technology load shapes
  -- Geographic Region: Northeast, South, Texas, West, Midwest
  -- Year: 2005, 2010, 2015, and 2020
  -- Season: Summer or Winter

- Emissions included: CO_2, SO_2, NO_X, and Hg
- Based on simulations of demand impacts using detailed and powerful power market model

Status/Plans

- Currently updating the parameters based upon latest IPM base case (2003) established by EPA.
- Incorporating into web-based tool during FY2004.

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ICF's Integrated Planning Model (IPM®) is a linear programming model that simulates integrated economic activity of fuel, emissions, capacity and generation markets of the electricity sector. IPM is particularly powerful in examining the effects of changes in electricity demand or supply on air emissions from electricity generation. It has been extensively used by the US EPA, industry, other government and non-governmental agencies in analyzing power markets, air emission changes, changes in fuel use and prices, renewable energy system power system changes, and other impacts of various approaches to air pollution control. The model contains a feature designed specifically for DSM analysis, which can analyze power market and air emission impacts of various load management, demand reduction options. Additionally, the model is well-equipped to handle the complexity of generation from renewable resources such as wind, solar, geothermal, small hydro, and biomass.